Space Weather Forecast

Issued on Monday, 11 April 2022 at 13:17 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Increasing chance of G1/Minor Geomagnetic Storms through the period, becoming likely by Day 4 (14 Apr).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with an eruption from a region without spots near south centre disc giving a Common-class flare at 11/0521 UTC. This eruption also looks like it has produced an Earth directed Coronal Mass Ejection (CME), with a full halo showing in coronagraph imagery. There is now one sunspot region on the Earth-facing disc. The region near the northwest limb has faded and is no longer visible, which may be partly due to its proximity to the limb. A new region has emerged in the northeast quadrant, but this is currently small and simple.

Solar Wind / Geomagnetic Activity: The solar wind was indicative of an ongoing fast wind from a coronal hole. The wind speed has varied between 450-550 km/s. The interplanetary magnetic field (IMF) was moderate to start but soon became mostly weak. The north-south component varied weakly, but has been largely southward directed. Geomagnetic activity has been Quiet to Active (Kp 2-4).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Very Low, with only one small and simple sunspot on the disc. There is just a slight chance of further C-class flares through the forecast period.

Solar Wind / Geomagnetic Activity: There is the possibility of a CME arrival either late on Day 2 (12 Apr) or more likely during Day 3 (13 Apr). A further CME occurred earlier on 11th. This feature has yet to be fully analysed, but is almost certainly Earth directed. Timings haven't been fully assessed, but the most likely arrival is on Day 4 (14 Apr). Current coronal hole fast wind effects are giving elevated solar wind speeds, and expected to continue to do so through Day 1 (11 Apr) and into early Day 2 before slowly easing.
Geomagnetic activity is forecast to be Quiet to Active, with a slight chance of G1/Minor Storms on Day 1. There is also a chance of G1/Minor Storms later Day 2 or on Day 3 should the CME from 09 April give a glancing blow, then G1/Minor Storm becomes likely with a slight chance of G2/Moderate Storm on Day 4 with the CME from 11 April arriving.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	30	40	60
Strong	G3	No	1	1	1	2
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	1	1	1	1
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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